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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,746	09/29/2003	Kalman Pelhos	169.12-0573	1485
164	7590	06/23/2005	EXAMINER	
KINNEY & LANGE, P.A. THE KINNEY & LANGE BUILDING 312 SOUTH THIRD STREET MINNEAPOLIS, MN 55415-1002			VERSTEEG, STEVEN H	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/673,746

Applicant(s)

PELHOS, KALMAN

Examiner

Steven H. VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/29/03 & 4/5/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: IDS filed 11/22/04.

## DETAILED ACTION

### *Information Disclosure Statement*

1. The reference crossed out on the IDS is a duplicate of a reference already cited of record.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **20B** (see Figure 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

3. The disclosure is objected to because of the following informalities: the serial numbers for the applications listed on pages 1 and 14 need inserted. Please be sure to avoid inserting new matter.

Appropriate correction is required.

***Claim Objections***

4. Claim 23 is objected to because of the following informalities: “opening” should be “openings” in claim 23 at line 1. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 20 is out of scope with claim 1 from which it depends. It appears that claim 20 should depend from claim 19.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 4-9, 12-15, 19, 22, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2003/0019745 A1 to Wang et al. (Wang).
10. For claim 1, Applicant requires a deposition system for oblique deposition comprising a source of vaporized species; a substrate contacted by vaporized species forming a tilted thin film;

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and a collimator having an array of holes oriented at approximately an oblique angle with the collimator placed between the source and the substrate to limit the passage to vaporized species traveling at approximately an oblique angle.

11. For claim 9, Applicant requires a method for collimated oblique deposition onto a substrate comprising placing a collimator between a source of material and the substrate wherein the collimator has a surface and the collimator has openings tilted at an angle relative to a substrate normal; applying energy such that vaporized species leave the source and travel through the openings; and depositing the vaporized species on the substrate resulting in a tilted thin film.

12. For claim 19, Applicant requires a collimator comprising a block having a surface and a center; and a plurality of openings being tilted at an angle relative to an axis drawn normal to the block.

13. Wang discloses an oblique sputtering deposition apparatus (abstract) comprising a sputtering target 10', substrate 15', and collimator 12'. The collimator is between the target and the substrate (Figure 2A) and has an array of holes at an oblique angle (Figures 3A, 4, 5, 6A, and 6B). Wang also discloses a method of using the apparatus [0004].

14. For claims 4, 12, and 22, Applicant requires the holes to be arranged in a radial pattern. For claims 5 and 13, Applicant requires the vaporized species that passes through the collimator to form a radial pattern in the tilted film form. Wang discloses the holes to be radial (Figure 5) and the film to be tilted [0029]. Inherently, if the collimator is radial, then the film will be as well.

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15. For claims 6, 14, and 23, Applicant requires the holes to be arranged in a circumferential pattern. For claims 7 and 15, Applicant requires the vaporized species that passes through the collimator to form a circumferential pattern on the tilted film. Wang discloses the holes to be radial (Figure 4) and the film to be tilted [0029]. Inherently, if the collimator is circumferential, then the film will be as well.

16. For claim 8, Applicant requires the holes to be arranged so that the tilted film has an azimuthal symmetry. The collimator in Figure 4 will result in an azimuthal symmetry.

***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 2, 3, 11, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0019745 A1 to Wang et al. (Wang) in view of ***Control of the tilted orientation of CoCrPt/Ti thin film media by collimated sputtering*** by Zheng et al. (Zheng).

19. For claims 2 and 20, Applicant requires the oblique angle to be greater than 35 and less than 90 degrees. For claims 3, 11, and 21, Applicant requires the angle to be greater than 55 and less than 75 degrees.

20. Wang is described above, but does not disclose the specific angle of the collimator holes.

21. Zheng discloses that the tilt of the collimator will affect the coercivity of the film (abstract). Thus, the collimator tilt is a result effective variable.

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22. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the collimator openings with an angle of greater than 55 and less than 75 degrees because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

23. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0019745 A1 to Wang et al. (Wang) in view of US 2002/0023831 A1 to Iwase et al. (Iwase).

24. For claim 10, Applicant requires applying differential pumping such that a first chamber is subjected to a first pressure and a second chamber is subjected to a second pressure where the first pressure is less than the second pressure.

25. Wang is described above, but does not disclose a differential pressure atmosphere within the sputtering chamber.

26. Iwase discloses that differential pumping where the chamber of the substrate is different from the chamber of the target when separated by a collimator is beneficial because is less scattering of the sputtering particles [0055] – [0056]. The deposition can occur when using an oblique cross-section collimator [0051].

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Wang to utilize differential pressure because of the desire to lessen scattering.

28. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0019745 A1 to Wang et al. (Wang) in view of *Control of the tilted orientation of*



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***CoCrPt/Ti thin film media by collimated sputtering*** by Zheng et al. (Zheng) and US

2002/0023831 A1 to Iwase et al. (Iwase).

29. For claim 16, Applicant requires a method of forming a magnetic storage media on a substrate with the media comprising at least one thin film tilted at an angle relative to a surface normal and having azimuthal symmetry with the method comprising depositing one or more materials through a collimator onto a substrate that has openings tilted at an angle greater than 45 and less than 90 degrees relative to a surface normal; and rotating the substrate during deposition.

30. Wang is described above, but does not disclose forming a magnetic storage media, rotating the substrate, or the angle of the collimator openings.

31. Zheng is described above. Zheng also discloses forming a magnetic layer using oblique collimated sputter deposition to form a hard drive (pg. 8007).

32. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wang to form a magnetic recording media on a substrate as taught by Zheng because of the desire to form a hard drive.

33. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the collimator openings with an angle of greater than 55 and less than 75 degrees because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

34. Iwase is described above and also discloses rotating the substrate during deposition to make film thickness more uniform [0074].



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35. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Wang to rotate the substrate during deposition because of the desire to form a more uniform film.

36. For claim 17, Applicant requires applying a first vacuum between the collimator and the substrate; applying a second vacuum between the collimator and the source; and applying differential pumping such that the substrate is subjected to a lower pressure than the source.

37. Wang is described above and does not disclose differential pumping.

38. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Wang to utilize differential pressure because of the desire to lessen scattering.

39. For claim 18, Applicant requires the openings to be distributed across the collimator for deposition at a substantially uniform thickness. Wang discloses the limitation [0024].

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.


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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
June 20, 2005